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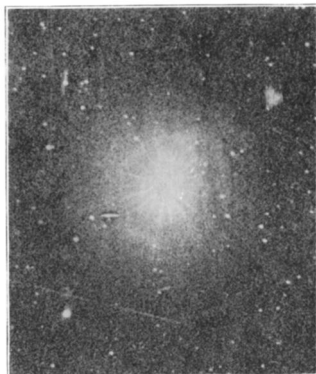
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THE NEBULOSITY AROUND NOVA PERSEI.



From a negative made with the Crossley Reflector of the Lick Observatory
on March 29, 1901. Exposure 10 min.



From a negative made with the Crossley Reflector of the Lick Observatory
on November 7 and 8, 1901. Exposure 7 h. 19 m.

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PHOTOGRAPHS OF THE NEBULOSITY SURROUND-
ING *NOVA PERSEI*.

BY C. D. PERRINE.

The accompanying illustrations of the faint nebulosity around *Nova Persei* are direct photographic reproductions of negatives obtained with the Crossley reflector of the Lick Observatory. These plates have been enlarged to two and one-quarter diameters, and the contrasts very much strengthened by successive copyings of the original negatives. The scale of the illustrations is $1^{\text{mm}} = 17''$. They have been selected from the series of eleven negatives which show this faint nebulosity. The principal movements and changes which have occurred are plainly visible.

The top of each plate is south.

The plate of March 29, 1901, shows the principal ring of nebulosity, which was visible on the photograph taken at that time. It is not quite continuous on the reproduction, but the brightest portions can easily be seen. A bubble in the glass of the original negative causes a defect in this ring on the west side. Some traces of the inner ring are to be seen, involved in the diffraction rings of the star. A faint, narrow arc of nebula can be made out in the northeast quadrant at a distance of $5'$ from the *Nova*.

The photograph of November 12-13, 1901, shows the inner region of nebulosity much the best of any of the negatives. A great amount of structure is to be seen in all parts of this bright ring. The brightest condensations are to the south and southeast. It was the displacement of these masses which led to the detection of the rapid motion in this entire ring of nebulosity. The diameter of this bright ring is $15'$.

Outside of this bright ring is another region of about 30' diameter, which is filled with very faint nebulosity showing some structure. Two arcs of considerable length can be traced near the outer edge of this region to the south and southeast.

There are two defects in this plate due to scratches in the glass of the original negative.

The last illustration is from the photograph taken on the nights of January 31 and February 2, 1902. The inner ring has faded very much in the interval, and shows the bright mass of nebulosity nearest to the *Nova* to a better advantage. The principal features of this inner ring are still to be traced, but with less ease than on the photograph of November. The arrow-shaped mass, A, to the southeast is conspicuous. A comparison of the plates will show what great changes it has undergone both in position and structure in the interval of about twelve weeks. To the southwest and north, near the edges of the plate, are to be seen the wisps of nebulosity which have made their appearance since the photographs of November. These masses are found to be in motion, and have been increasing in brightness, while other portions of the nebula have been fading.

The phenomena observed in this nebulosity are very perplexing, and so far no theory seems to account satisfactorily for all the changes observed.

In March a negative was secured of the nebula with a double-image prism for the purpose of detecting any polarized light. The result is not entirely conclusive, but indicates that there is little or no polarization in the light of the only two masses which were bright enough to record themselves on the negative.

The negative of March 29, 1901, was taken by Messrs. H. K. PALMER and C. G. DALL. The others were obtained by the writer with the assistance of Messrs. H. K. PALMER and JOEL STEBBINS.

MT. HAMILTON, CALIFORNIA, July 25, 1902.

THE NEBULOSITY AROUND NOVA PERSEI.



**From a negative made with the Crossley Reflector of the Lick Observatory
on January 31 and February 2, 1902. Exposure 9 h. 45 min.**